

into a single fiber matrix structure resulting in a single improved composite part. The Examiner should note that Boyce is an inventor of the reference and also of this application. It was not until after the first invention that the inventors realized that reinforcing elements (e.g. boron pins) could be inserted through the thickness of two composite parts and that the extending reinforcing elements within an adherent (brazed) form an excellent joint between the two composite parts. See claim 1; specification, page 4, lines 9-17.

Indeed, the reference specifically states that "the exposed ends 52 of reinforcing elements 14 are rounded flush with abrasive wheel 54, as indicated in Fig. 7". Column 4, lines 2-6.

So, in the first application, the applicants realize that the reinforcing pins reinforce one composite part. Next, they had to realize that instead of filing the exposed ends of the reinforcing pins flush, the pins of one part should be left extending, the pins of another part should be left extending, and also that these extending pins at the joint region provided "more surface area in the joint region 30 for adherent 36 to secure the joint surfaces of the part; that is, extending interstitially disposed reinforcing elements 32 form a mechanical interlock which improves joint strength over prior methods where the adherent was secured only to the joint surfaces of each part. Moreover..., the adherent used may be urged partially up the length of the

individual reinforcing elements as shown at 34 for even a more a cohesive bond. The reinforcing elements, therefore, prevent surface ply delamination and improve the strength of joint 36. See the specification, page 10, line 16 through page 11, line 2.

Why the Examiner states that this is obvious especially since the prior patent specifically discloses that the pins are rendered flush is not understood. The prior patent does not disclose anything about joining two parts.

Here is what the Examiner considers obvious: reading the prior patent which states the pins are inserted in a single part and filed flush, realizing that the pins could be left extending in one part, realizing that the pins could be left extending in another part, realizing that the extending pins of one part could be interstitially arranged with the extending pins of another part and realizing that the interstitially disposed pins provide more surface area for the adherend to form an improved mechanical interlock.

Note, however, that for 35 USC Section 103 rejection

"Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion or incentive to do so." Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification...

Here, the Examiner relied upon hindsight to arrive at the determination of obviousness. It is impermissible to

use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

In re Fritch, 23 USPQ 2d 1780, 1783-1784 (CAFC 1992).

The rule is that there must be some teaching, suggestion, or inference in either reference, or both, or knowledge generally available to one of ordinary skill in the relevant art, which would have led one of ordinary skill in the art to combine the relevant teachings of the references. Therefore, it is the Examiner's obligation, where a combination of references is relied upon to establish obviousness, to explain why combination of the reference teachings is proper if not readily apparent. In other words, the Examiner must indicate the reasons why one skilled in the art would have substituted an element of teaching of a first reference for that part of the second.

Ex parte Skinner, 2 USPQ 2d 1788, 1790 (BPAI 1986).

Therefore, since the applicant's now claimed invention was not taught or suggested by Boyce and since Boyce does not provide any impetus to one skilled in the art to achieve the modification now claimed, it is respectfully requested that the Boyce reference be removed as a Section 103 rejection.

In Boyce, the foam body is used to insert pins into one part, and then the foam body is removed. In this application, the applicant's claim inserting pins into one composite part in the same way but also inserting the pins into another composite part in the same way and leaving the pins extending and forming an interstitially arranged pin joint area between the two parts.

Boyce fails to discuss or suggest such a procedure or methodology. Instead, Boyce teaches away from such a method since it is specifically recited that the pins are to be rendered flush. Boyce does not mention or suggest the formation of a joint between two composite parts.

The Examiner also states Holko, which fails to teach reinforcing elements, can be combined with Kreider which teaches fiber reinforced articles.

The applicant fails to see the suggested combination. Kreider teaches the manufacture of filaments in a metal matrix for monolayer tapes. See column 2, lines 27-36. The result is a flat tape which can be laid up to form a composite part. Column 4, lines 36-50. The tape has a brazing metal foil layer, reinforcing elements contiguous (adjacent) to one face of the foil layer, and "aligned with each other along the tensile axis of the composite metallic material". Column 8, lines 17-24. Then, a plasma sprayed brazeable metal layer is bonded to the filaments and one face of the foil layer. Column 8, lines 25-28.

Therefore, Kreider fails to disclose and in fact specifically teaches away from reinforcing elements through the thickness of two composite parts to be joined or through the thickness reinforcing elements extending from the joint surface of each part as claimed by the applicant. The teaching of Kreider even combined with Boyce does not result in an interstitially arranged joint region of extending pins nor could it since Kreider specifically teaches only

monoliar tapes having reinforcing elements aligned with each other along the tensile axis of the composite metallic material (in the plane of the composite) instead of extending through the thickness of the composite.

Same is true of Holko which is specifically directed at vacuum furnace brazing. No art teaches or suggests using through the thickness reinforcing elements as part of the joint to make the joint stronger. No art teaches urging the adhering up along the length of the through the thickness pins for even a stronger bond at the joint region.

To warrant an obviousness rejection, the references must teach pursuit of the same problem.

Thus the question is whether what the inventor did would have been obvious to one of ordinary skill in the art attempting to solve the problem upon which the inventor was working.

* * *

The problem solved by the invention is always relevant. The entirety of a claimed invention, including the combination viewed as a whole, the elements thereof, and the properties and purpose of the invention, must be considered.

In re Wright, 6 USPQ2d 1959 (CAFC 1988), pages 1961, 1962.

Holko and Kreider failed to teach pursuit of the same problem noted by the applicant, in the same way at the applicant. Holko is specifically directed at a very high temperature high pressure bonding between two carbon composite components without any discussion of reinforcing elements through the thickness of the composite components.

Kreider, in contrast, is directed at a process characterized by a high degree of reproduceability using a spring loaded mandrel to produce a monolayer type including a brazable alloy which maintains fiber collimation and also allows bonding at low pressures. Column 8, lines 2-6. It is impossible for collimated fibers extending and aligned with each other along the tensile axis of the metallic material to be construed or considered to be extending through the thickness of the composite.

The Examiner also objects to the specification under 35 USC Section 112 first paragraph as failing to provide enablement.

35 USC Section 112 states the specification shall contain a written description of the invention, and the manner and process of making it and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out this invention.

The function of the description requirement is to insure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him; how a specification accomplishes this is not material. In re Smith, 41 F.2d 910; 178 USPQ 620 (CCPA) 1973 (and the cases cited therein) It is not necessary that the application describe the claimed limitations exactly, In re Lukach, supra but only so clearly that persons of ordinary skill in the art will recognize from the disclosure that the appellants invented process includes of those limitations. In re Smythe, 480 F2d 1376, 1382; 178 USPQ 279, 284 (CCPA 1973).

In re Wertheim, 1991 96, (1976).

The test for adequacy is whether one skilled in the art would understand all the language in the claims when they

are read in the light of the specification, as they must be. The amount of detail required to be included depends on the particular invention and the prior art and not to be viewed in the abstract but in conjunction with whether the specification is in compliance with the first paragraph Section 112. If the claims, drawings and the specification, reasonably appraise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, no more should be demanded.

The applicant could have recited reinforcing means and adherent means pursuant to the last paragraph of Section 112. Instead, the applicant claims reinforcing elements extending through the thickness of the composite adherand. In a preferred embodiment, the specifications states that the reinforcing elements are fibers or wires. See page 11, lines 1 and 2. Since particulate fillers would not be able to extend through the thickness of a composite part or left extending from the surface thereof, the applicant's recitation of reinforcing elements is believed adequate.

The applicant's do not understand what the Examiner means by "metal bars" but if they are metallic wires, they would be "reinforcing elements" within the scope of the applicant's claims and specification.

The specification also recites that an adherand denotes one part and an adherent is a film adhesive or prepreg material or braze. The claims recite "disposing an adherent

within said joint region about said interstitially disposed reinforcing elements and said joint surfaces". It is difficult to envision how someone could construe an adherent discussed in this sense disposed within the joint region to be "nails", "screws", "twine", etc as pointed out by the Examiner.

Furthermore, whether or not the claims are beyond the scope of the disclosed enamblement is an infringement, not a Section 112 analysis.

This application contains a written description of the invention and the manner and process of making it and using it in full, clear, concise and exact terms which would enable any person skilled in the art to which it pertains or with which it is most nearly connected to make and use the same. This specifications sets forth the best mode contemplated by the inventors of carrying out the invention at the time the application was filed.

Accordingly, it is respectfully submitted that all the claims are allowable. The applicant confirms election of claims 1-4, 6-7, 9-19, 20 and 22 with traverse.

Each of Examiner's rejections has been addressed or traversed. Accordingly, it is respectfully submitted that the application is in condition for allowance. Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution,

please telephone the undersigned or his associate, Joseph S. Iandiorio, collect in Waltham, Massachusetts, (617) 890-5678.

Respectfully submitted,

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